

FS5VSH-3

HIGH-SPEED SWITCHING USE

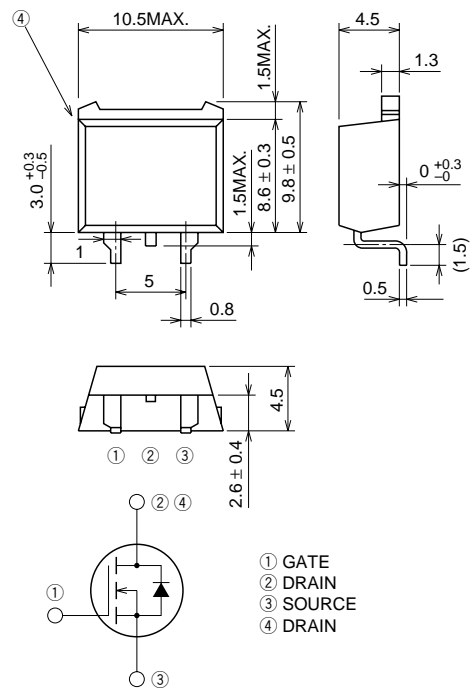
FS5VSH-3



- 2.5V DRIVE
- V_{DS} 150V
- $r_{DS} (ON) (MAX)$ 0.35Ω
- I_D 5A
- Integrated Fast Recovery Diode (TYP.) 85ns

OUTLINE DRAWING

Dimensions in mm



TO-220S

APPLICATION

Motor control, Lamp control, Solenoid control
DC-DC converter, etc.

MAXIMUM RATINGS (Tc = 25°C)

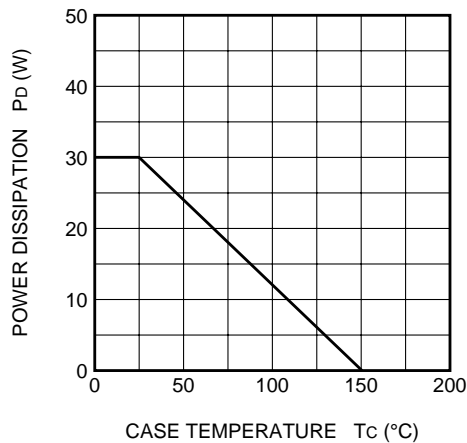
Symbol	Parameter	Conditions	Ratings	Unit
V_{DS}	Drain-source voltage	$V_{GS} = 0V$	150	V
V_{GS}	Gate-source voltage	$V_{DS} = 0V$	± 10	V
I_D	Drain current		5	A
I_{DM}	Drain current (Pulsed)		20	A
I_{DA}	Avalanche drain current (Pulsed)	$L = 100\mu H$	5	A
I_S	Source current		5	A
I_{SM}	Source current (Pulsed)		20	A
P_D	Maximum power dissipation		30	W
T_{ch}	Channel temperature		$-55 \sim +150$	°C
T_{stg}	Storage temperature		$-55 \sim +150$	°C
—	Weight	Typical value	1.2	g

ELECTRICAL CHARACTERISTICS (T_{ch} = 25°C)

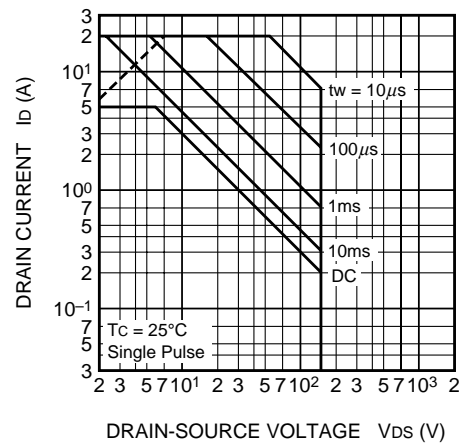
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V _{(BR) DSS}	Drain-source breakdown voltage	I _D = 1mA, V _{GS} = 0V	150	—	—	V
I _{GSS}	Gate-source leakage current	V _{GS} = ±10V, V _{DS} = 0V	—	—	±0.1	μA
I _{DSS}	Drain-source leakage current	V _{DS} = 150V, V _{GS} = 0V	—	—	0.1	mA
V _{GS(th)}	Gate-source threshold voltage	I _D = 1mA, V _{DS} = 10V	0.6	0.9	1.2	V
r _{DS(ON)}	Drain-source on-state resistance	I _D = 2A, V _{GS} = 4V	—	0.27	0.35	Ω
r _{DS(ON)}	Drain-source on-state resistance	I _D = 2A, V _{GS} = 2.5V	—	0.28	0.37	Ω
V _{DS(ON)}	Drain-source on-state voltage	I _D = 2A, V _{GS} = 4V	—	0.54	0.70	V
y _{fs}	Forward transfer admittance	I _D = 2A, V _{DS} = 5V	—	12	—	S
C _{iss}	Input capacitance	V _{DS} = 10V, V _{GS} = 0V, f = 1MHz	—	1200	—	pF
C _{oss}	Output capacitance		—	100	—	pF
C _{rss}	Reverse transfer capacitance		—	35	—	pF
t _{d(on)}	Turn-on delay time	V _{DD} = 80V, I _D = 2A, V _{GS} = 4V, R _{GEN} = R _{GS} = 50Ω	—	19	—	ns
t _r	Rise time		—	34	—	ns
t _{d(off)}	Turn-off delay time		—	100	—	ns
t _f	Fall time		—	60	—	ns
V _{SD}	Source-drain voltage	I _S = 2A, V _{GS} = 0V	—	1.0	1.5	V
R _{th(ch-c)}	Thermal resistance	Channel to case	—	—	4.17	°C/W
t _{rr}	Reverse recovery time	I _S = 5A, di _s /dt = -100A/μs	—	85	—	ns

PERFORMANCE CURVES

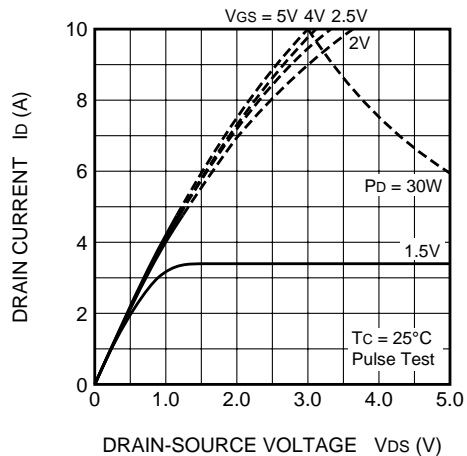
POWER DISSIPATION DERATING CURVE



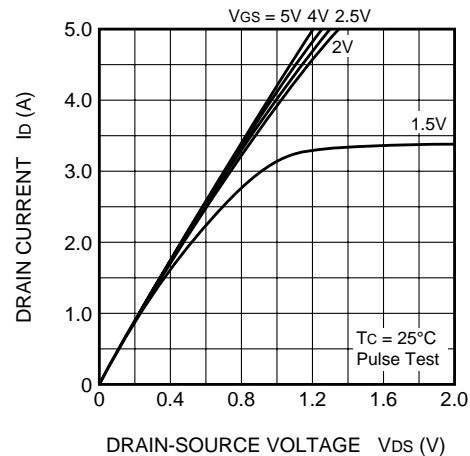
MAXIMUM SAFE OPERATING AREA



OUTPUT CHARACTERISTICS (TYPICAL)



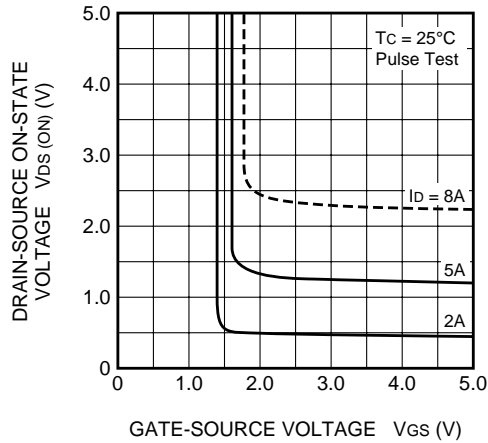
OUTPUT CHARACTERISTICS (TYPICAL)



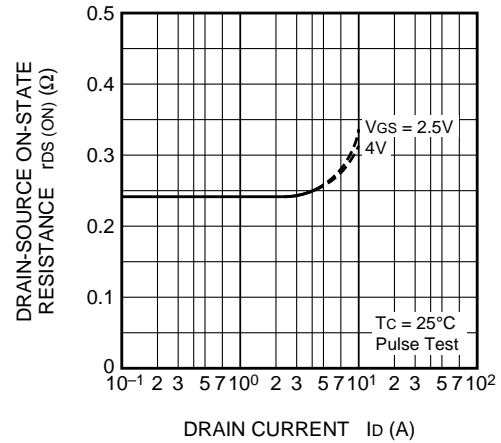
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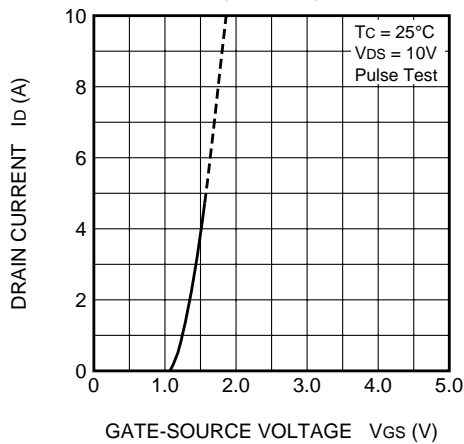
**ON-STATE VOLTAGE VS.
GATE-SOURCE VOLTAGE
(TYPICAL)**



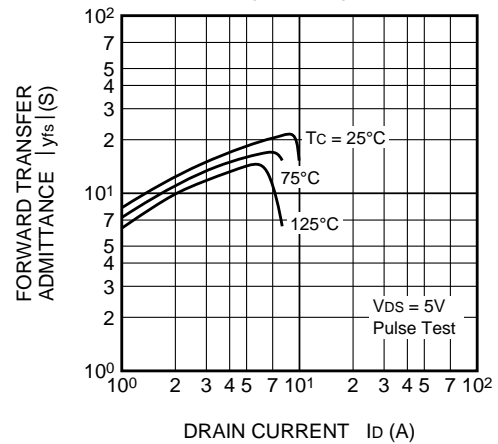
**ON-STATE RESISTANCE VS.
DRAIN CURRENT
(TYPICAL)**



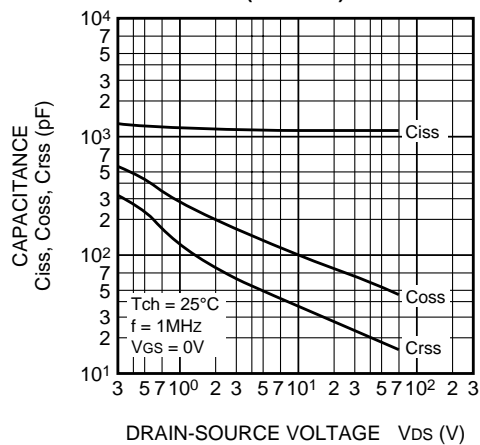
**TRANSFER CHARACTERISTICS
(TYPICAL)**



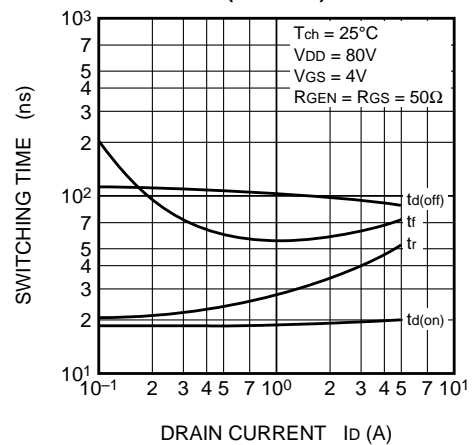
**FORWARD TRANSFER ADMITTANCE
VS. DRAIN CURRENT
(TYPICAL)**



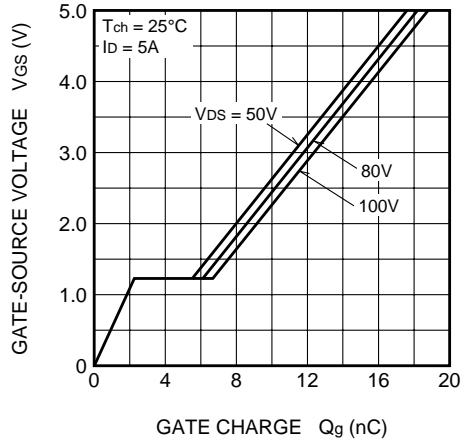
**CAPACITANCE VS.
DRAIN-SOURCE VOLTAGE
(TYPICAL)**



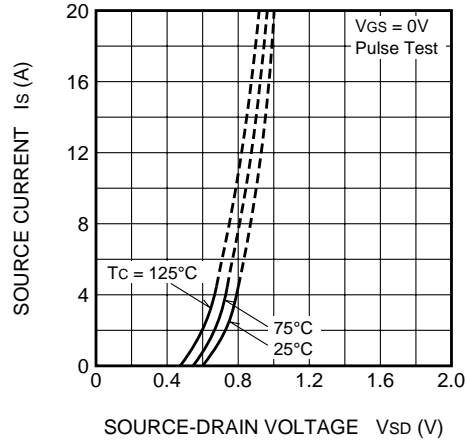
**SWITCHING CHARACTERISTICS
(TYPICAL)**



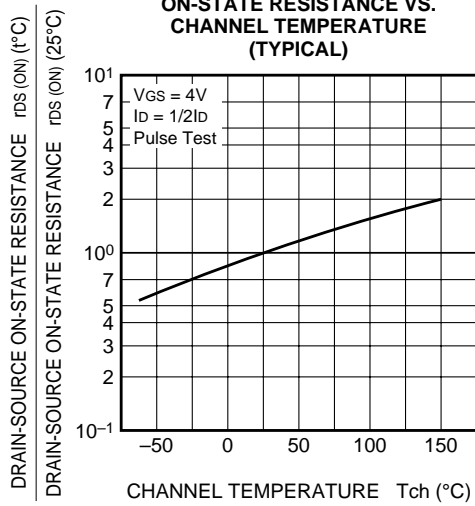
**GATE-SOURCE VOLTAGE
VS. GATE CHARGE
(TYPICAL)**



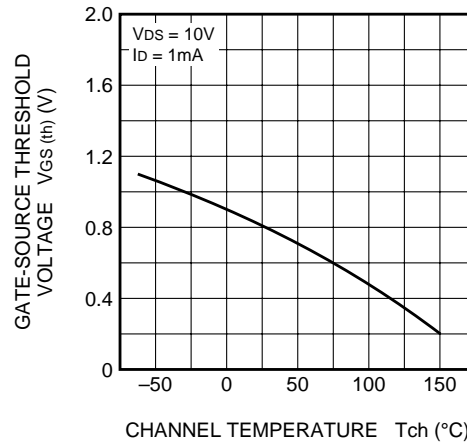
**SOURCE-DRAIN DIODE
FORWARD CHARACTERISTICS
(TYPICAL)**



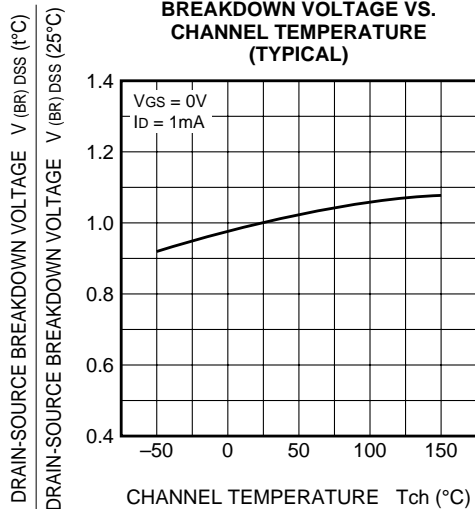
**ON-STATE RESISTANCE VS.
CHANNEL TEMPERATURE
(TYPICAL)**



**THRESHOLD VOLTAGE VS.
CHANNEL TEMPERATURE
(TYPICAL)**



**BREAKDOWN VOLTAGE VS.
CHANNEL TEMPERATURE
(TYPICAL)**



**TRANSIENT THERMAL IMPEDANCE
CHARACTERISTICS**

